# ADMINISTRATIVE OFFICE OF THE COURTS
# WASHINGTON STATE PATROL

## eCitation Pilot Final Report

April 28, 2003

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# I. EXECUTIVE SUMMARY

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A Washington State law enforcement officer (LEO) observes a motorist commit a traffic offense. he/she turns his/her lights on and stops the vehicle. The officer conducts a driver's and vehicle check and determines the infractions, if any, for which he/she will issue a traffic citation. The officer completes the five-part Notice of Infraction (NOI),[2] explains the infraction and the court instructions, requests that the motorist sign the NOI, and gives the third copy to the motorist. The officer completes a case report about the incident for later use.

The LEO sends the original citation to the local court of jurisdiction, forwards the second copy to the Department of Licensing (DOL), forwards the fifth copy to the Law Enforcement Agency (LEA) for which the LEO works, and the officer keeps the fourth copy. The local court of limited jurisdiction (CLJ), DOL, and LEA enters the citation data into their respective information systems. The paper citations cycle through the data entry and adjudication process takes weeks to complete the process.

This scenario repeats itself thousands of times each day throughout the state. Several issues arise from this paper-based process, including:

- *Redundant Data Entry* – The current data flow structure for traffic infractions and criminal citations involves entry of information as many as four times per cycle.
  - » The LEO enters by hand the information into the NOI.
  - » The LEA enters the NOI information into their system and use it to reconcile with the ticket books they issue to the LEO.
  - » Courts enter the traffic citation into the Administrative Office of the Courts (AOC) Judicial Information System (JIS).
  - » DOL enters the NOI and the corresponding judgment information from the courts into the driver's record.
- *Data Errors* – Many keying errors are made while transcribing the data, resulting in additional time to process or reprocess citation information.
- *Long Cycle Time* – The time required to process a paper citation can take weeks because of the need to handle high volumes of NOI documents. Backlogs are common in the courts and at DOL and are getting worse with the increasing citation volume.

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[2] NOIs include traffic and nontraffic infractions and traffic and nontraffic criminal citations.

## A. eCITATION PILOT

AOC and the Washington State Patrol (WSP) initiated the eCitation Pilot Project to conduct a proof of concept to address these issues and answer the following questions:

- Can LEOs generate an electronic citation during a traffic stop and forward the citation data to organizations that process the citation (i.e., DOL, CLJ, and WSP)?
- Is current technology capable of supporting an electronic citation process?
- What are the impacts on LEOs and LEAs in deploying electronic citation processes?
- What are the obstacles associated with deploying electronic citations in Washington State?

The WSP acquired the Traffic and Criminal Software (TraCS) system from the Iowa Department of Transportation. This software, which is free to LEAs, is a customizable data collection system that can be used by law enforcement and motor vehicle agencies nationwide. The TraCS architecture, along with a Software Development Kit (SDK), allows agencies to design their own local or state forms, validation edits, and process flows. Agencies gather citations using the TraCS Office database program. The citation data is sent to a central server at WSP in Olympia and then forwarded to the AOC, where the citation is inserted as a case into the AOC JIS. CLJs can access the citation case through the AOC District Court Information System (DISCIS), adjudicating the case and updating the case record within JIS. AOC can then forward the citation electronically to DOL for it to process.

AOC developed prototype TraCS citation forms. WSP acquired and configured the technical equipment and recruited Commercial Vehicle Troopers to participate in the pilot. AOC developed interfaces from the WSP server, populating the electronic citation data into the JIS database.

The troopers using the TraCS architecture completed several commercial vehicle and regular traffic stops. This sampling of electronic citations was successfully transferred to AOC. The troopers participated in several focus group exercises to analyze the use of the technology and the integration within their business processes.

## B. PILOT RESULTS

The pilot is successful in demonstrating that an electronic citation can be captured during the traffic stop by the LEO who collects the original information and efficiently forwards it to the AOC and then on to the CLJ and DOL for further processing. Technology is available that can support collecting electronic citations. Interfaces are being developed that can quickly and efficiently trans-

mit the data to AOC's JIS, eliminating redundant data entry in local courts, DOL, and law enforcement agencies.

However, several major work flow problems were encountered by the troopers that make the current process unusable by LEOs in an efficient and effective manner. Troopers report that it takes too much time to key in the citation data and print multiple copies of the citation. Preparing the electronic citation requires the focus of the troopers on the technology, resulting in their loosing focus on motorists, potentially creating a safety issue. The troopers like the overall concept, but these work flow issues must be resolved before this approach will be acceptable for law enforcement participation.

The business case for implementing an electronic citation is strong enough to warrant continuing working toward removing the obstacles and implementing a comprehensive statewide electronic citation program. The efficiencies of eliminating redundant data entry, increasing throughput times, reducing backlogs, and increasing accuracy have great appeal and merit. The troopers identified several ancillary uses of the TraCS architecture to use additional forms for collecting data that is a routine part of their business processes.

The pilot project team proposes the following recommendations as a result of the project:

Recommendation #1 AOC and WSP should continue research and development of the eCitation concept.

Recommendation #2 AOC and WSP should wait until the DOL Driver's License migration to the new digitized license has reached 80 percent deployment before beginning the statewide rollout.

Recommendation #3 DOL should include a two-dimensional bar code on the vehicle title and registration so that LEOs can acquire vehicle information through bar code scanning.

Recommendation #4 Work with the legislature to change the Revised Code of Washington (RCW) to enable the eCitation program.

Recommendation #5 Improve the use and functionality of the TraCS application.

Recommendation #6 Identify opportunities to create other TraCS forms to replace the paper forms that LEOs use in a traffic stop.

Recommendation #7 Continue research and development to improve the technical eCitation deployment of technology and the interfaces to AOC.

This report contains the following sections:

- Recommendations
- eCitation Architecture
- Findings and Issues
- Next Steps

# II. RECOMMENDATIONS

## II. RECOMMENDATIONS

The eCitation pilot was successful in demonstrating that citations can be effectively captured by LEOs during traffic contacts. However, significant work flow issues need to be overcome for law enforcement to effectively use the technology.

Recommendation #1 – AOC and WSP should continue research and development of the eCitation concept.

The business case contains sufficient benefits to justify continuation of the research and development of the eCitation project. The business case associated with eCitations is compelling, particularly in the reduction of redundant data entry, increasing the speed of transferring the citation to AOC, DOL, and the local courts (via AOC).

The financial business case for this project includes the following estimates:[3,4]

| Item | FY 1 | FY 2 | FY 3 | FY 4 | FY 5 | 5- Year Total |
|---|---|---|---|---|---|---|
| **Change in Business Program Costs** | | | | | | |
| Reduction in Data Entry Costs (Note 1) | $ (4,095.00) | $ (4,095.00) | $ (4,095.00) | $ (4,095.00) | $ (4,095.00) | $ (20,475.00) |
| Eliminate 10 DOL FTEs (Note 2) | (300.00) | (300.00) | (300.00) | (300.00) | (300.00) | (1,500.00) |
| ***Total Change in Recurring Business Costs*** | $ (4,395.00) | $ (4,395.00) | $ (4,395.00) | $ (4,395.00) | $ (4,395.00) | $ (21,975.00) |
| | | | | | | |
| **Project Costs** | | | | | | |
| eCitation Pilot | $ 500.00 | | | | | $ 500.00 |
| Statewide Rollout | 4,000.00 | $ 4,000.00 | | | | 8,000.00 |
| ***Total Project Costs*** | $ 4,500.00 | $ 4,000.00 | $ - | $ - | $ - | $ 8,500.00 |
| | | | | | | |
| ***Total Costs*** | $ 105.00 | $ (395.00) | $ (4,395.00) | $ (4,395.00) | $ (4,395.00) | $ (13,475.00) |
| ***Net Present Value (6%)*** | ($10,708.07) | | | | | |
| ***Break-Even Point*** | | ^ | | | | |

Additional intangible benefits exist that justify the continuation of this project. These include:

- *Improve Data Accuracy* – The eCitation program will increase data accuracy by reducing the number of data entry errors caused by keying the same information into multiple databases

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[3] Note 1: Cost reductions accrue to cities and counties supporting district and municipal courts. Assume electronic citations eliminate 15 percent of the workload associated with a citation case. Assume the ratio of citation cases to overall cases (60 percent) remains the same. Assume the workload reduction is tied directly to an FTE reduction. Assume an FTE costs $35,000 annually.

(0.6) × (0.15) × (1,300 FTEs) × ($35K) = $4,095K

[4] Note 2: This project enables the AOC to meet the statewide requirements for the DHIP project, which DOL estimates will eliminate 10 FTEs.

(10 FTEs) × ($30K) = $300,000

and by difficulty interpreting handwritten documents. This results in better decision making and improved goodwill between citizens and the court system.

- *Reduce Cycle Time* – Currently a citation may take weeks to process because of the manual process of working with paper forms. eCitations will expedite entry and sharing of citation data, making the courts and DOL more responsive in processing citation transactions.

- *Improve Matching Disposition to Citation in Disparate System* – The eCitation program provides the ability to improve the match of dispositions to citations because the flow of data to the AOC JIS citation repository and DOL repository contains the exact same linking data that is matched while the disposition is being processed.

- *Move Law Enforcement From a Paper to Electronic-Based Work Flow* – Several opportunities exist to improve the efficiency and accuracy of the LEOs' work flow in using technology and bar coding to gather and record information. This permits integration with other available applications, such as court scheduling, that are becoming available.

Recommendation #2 – AOC and WSP should wait until the DOL Driver's License migration to the new digitized license has reached 80 percent deployment before beginning the statewide rollout.

It currently requires too much time for LEOs to enter all of the information into a TraCS form. However, the new digital driver's license contains the driver's information in a bar code format that can be scanned and captured into the eCitation forms. This expedites law enforcement's preparation of the citation and should result in savings in time to LEOs conducting traffic stops.

DOL estimates 80 percent deployment will occur by July 2005, based upon the schedule for renewing driver's licenses.

Recommendation #3 – DOL should include a two-dimensional bar code on the vehicle title and registration so that LEOs can acquire vehicle information through bar code scanning.

LEOs need to record information from the DOL vehicle title and registration. Placing a two-dimensional bar code on the vehicle title and registration will allow LEOs to scan and acquire the vehicle information without having to manually record the information. This will result in time savings and improved accuracy.

Recommendation #4 – Work with the legislature to change the RCW to enable the eCitation program.

Two RCWs need to be changed to facilitate the eCitation program business flows:

- *RCW Changes to Allow Electronic Citations So Paper Can Be Eliminated* – The current paper work flow and routing is mandated in the RCW. Other states are eliminating the traditional citation.
- *RCW Changes to Eliminate the Violator Signature to Facilitate Electronic Capture of Data* – The current statutes requires a signature on citation forms. Several other states have statutes that allow issuing citations without obtaining motorist signatures. By not collecting violator signatures, the work flow associated with a traffic stop can be streamlined to integrate an eCitation. The pilot required obtaining signatures on two citations (i.e., the citizen copy and the officer copy), which was awkward for the troopers to obtain.

Recommendation #5 – Improve the use and functionality of the TraCS application.

AOC and WSP need to work with Iowa's TraCS Steering Committee to request and incorporate improvements in the software. The TraCS program has an aggressive schedule to respond to user states' requests for enhancements. Many of the requested enhancements initiated by other states will directly benefit Washington. Washington needs to provide direct feedback on its findings regarding the software and request enhancement that will improve Washington's use of the product. Washington may need to fund some of these enhancements.

Several enhancements that are being considered include:

1. Establishing interfaces to the Federal Motor Carrier Safety Administration (FMCSA) ASPEN systems. (Critical to Commercial Vehicles Programs)
2. Integrating and using handheld devices. (Critical to some local LEAs)
3. Replacing the Access database in TraCS Office to use an SQL database.
4. Improving the TraCS system's development tool kit.
5. Changing the architecture to a Web-based technology.

Recommendation #6 – Identify opportunities to create other TraCS forms to replace the paper forms that LEOs use in a traffic stop.

Troopers participating in the pilot note that the use of TraCS Mobile program could be expanded to use other TraCS forms to replace paper forms. Developing and using TraCS to collect standards data is a Justice Information Network (JIN) issue that needs JIN input and approval to ensure adherence to statewide data standards. Potential forms that should be considered include:

- Inspections
- Weight and Speed Affidavits
- Impound
- DUI Report
- Collision Report
- Commercial Vehicle Inspection (UDVIR)
- Exchange of Drivers Information

Recommendation #7 – Continue research and development to improve the technical eCitation deployment of technology and the interfaces to AOC.

Several technical issues need to be researched and solutions developed to improve the eCitation architecture. These items include:

- Complete the implementation of the XML data transfer processes from WSP, AOC, and DOL so that a complete end-to-end test can be completed.
- Complete a list of fixes and fully test eCitation forms.
- Conduct research into better technology solutions, including printers, scanners, laptops, and handwriting recognition software to develop a faster, safer, and more ergonomically comfortable configuration.
- Develop a data upload process that is more convenient and efficient to use (wireless LAN).
- Develop the infrastructure for distributing citation form updates to all law enforcement agencies.
- Develop a complete set of technical standards for use by other agencies.
- Conduct research into officer safety issues encountered/solved by other states.
- Develop an architecture for a state citation server that allows LEAs to query their electronic citations.

# III. eCITATION ARCHITECTURE

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This section describes the eCitation architecture that WSP and AOC developed during the pilot and proposes a statewide eCitation Architecture Framework.

## A. PILOT ARCHITECTURE

The WSP and AOC participated in the pilot. EXHIBIT I presents the technical architecture that was used in the pilot project. Four Thurston County-based WSP Commercial Vehicle Enforcement Officers (CVEO) participated in the pilot. WSP provided troopers with a "ruggedized" laptop computer and printer that was mounted in their cars. One trooper used a wireless touch-screen monitor that could be taken outside of the car. AOC technicians loaded TraCS Mobile on each trooper's laptop computer. The troopers keyed citation data into the laptop computers and printed three copies of the citation, obtaining signatures from the violator on two of the printed copies. When the troopers completed their shifts, they returned to their office and connected to the WSP citation server, located in the Tumwater WSP data center, using the WSP network.

The WSP eCitation administrator used a workstation installed with TraCS Office and connected to the WSP citation server. The WSP eCitation administrator pushed the citation data from the WSP citation server to AOC using an XML transfer program, developed by AOC. AOC developed a process to insert the citation data into the JIS system. The Thurston County District Court used the AOC DISCIS application to update the citation cases with disposition information.

## B. PROPOSED STATE eCITATION FRAMEWORK

The eCitation architectural framework is shown in Figure 1 below. LEOs use the TraCS Mobile forms to collect citation data. Upon returning to their offices, they upload the data to TraCS Office. They may also upload the citation data into the LEA server. The data is transferred to the statewide citation database server that AOC maintains. LEAs can execute queries to obtain citation information from the statewide citation collector. AOC pulls the data through an XML interface and edits and inserts the citation data into the AOC JIS database. Local courts can access the citation information by using the existing DISCIS screens. Local courts will add the disposition of the citation through the DISCIS screens, updating the citation information contained in the JIS database. AOC will transfer citations along with the dispositions to DOL, which will update the drivers database directly.

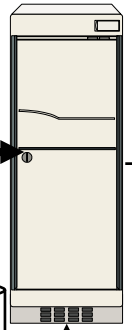
ADMINISTRATIVE OFFICE OF THE COURTS
WASHINGTON STATE PATROL
eCITATION PILOT PROJECT

**ARCHITECTURE**

**TraCS Laptop (Trooper)**

Intel PIII-500 MHz
256Mb/30Gb, NIC,
Ruggedized, Touch-Screen,
Backlit Keyboard
Windows 2000
Novell Client for W2000
TraCS Mobile 6.5
Norton Antivirus
MCN Access/MCN Network

**TraCS Server (WSP Data Center)**

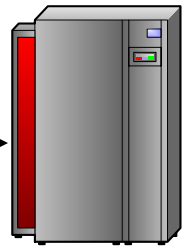


TraCS Data

Intel P4-1GHz
512Mb/30Gb, NIC
Windows 2000
Norton Antivirus

***XML Interface***

**JIS (AOC Mainframe)**



JIS Database

**TraCS Workstation (TraCS Administrator)**

Windows 2000
Novell Client for Windows
MS Access 2002 (XP)
TraCS Office 6.5
Norton Antivirus

**Courts Workstation (Courts of Limited Jurisdiction)**

***DISCIS***

AOC Standard

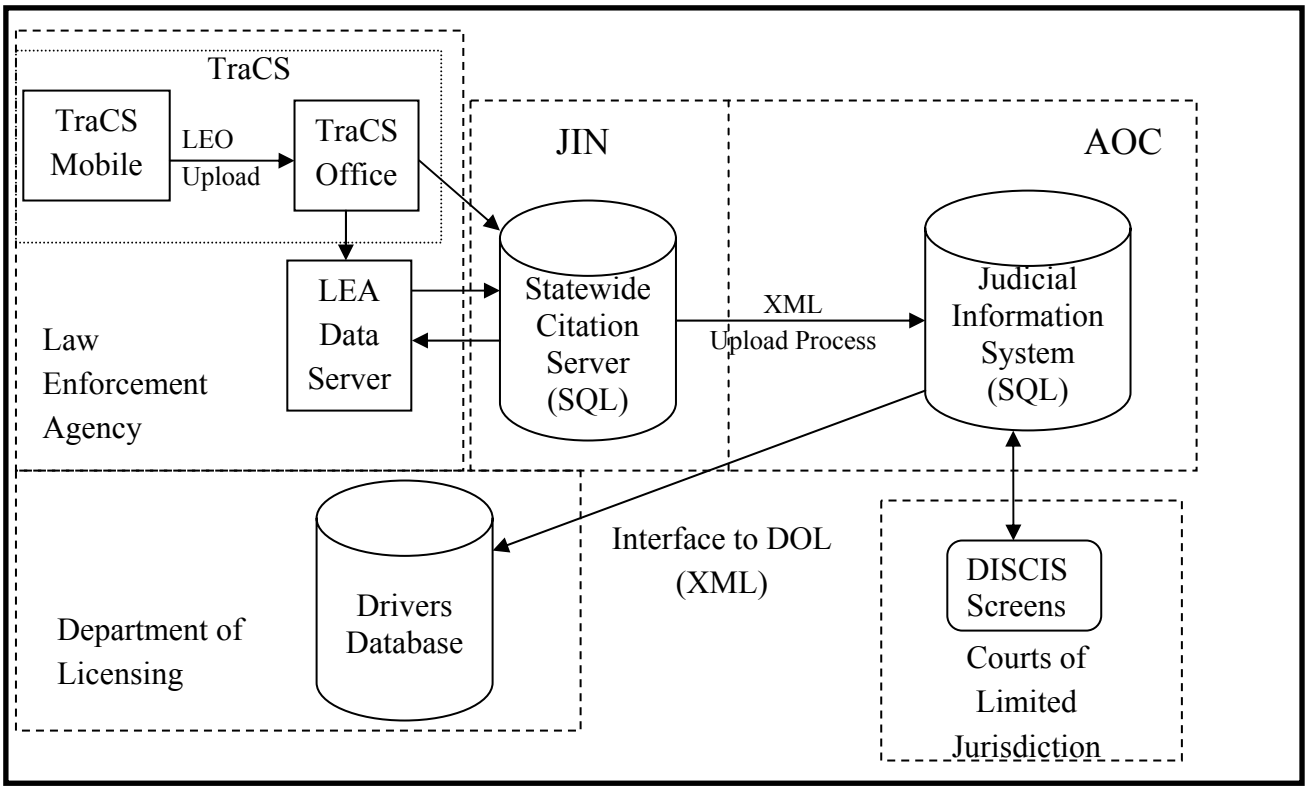



*Figure 1 – eCitation Architectural Framework*

1. TraCS

TraCS is a customizable data collection system available to law enforcement and motor vehicle agencies nationwide. TraCS includes TraCS Mobile, TraCS Office, and an SDK. The TraCS architecture allows agencies to design their own local or state forms, validation edits, and process flows with minimal effort. Law enforcement agencies capture electronic data in forms at the time of activity. TraCS Office collects data from TraCS mobile units and populates a relational database that agencies may customize to meet their own unique needs.

TraCS was developed by the Iowa Department of Transportation through a contract with Technology Enterprise Group (TEG), from Harmony, Pennsylvania, which continues to support the application. Several other states are beginning to incorporate TraCS to collect citation data and incorporating it into their work flow. These states include: Iowa, Arizona, Colorado, South Dakota, Nebraska, Oklahoma, Wisconsin, Arkansas, Tennessee, New York, New Hampshire, Maryland, Alabama, Georgia, South Carolina, and Florida. A national steering committee composed of states licensed to implement TraCS meets periodically to review and prioritize software enhancements and to share challenges and successes. Several states are currently initiating projects to coordinate and interface with the Inspection Selection System (ISS), a component of ASPEN developed by the FMCSA to aid in the selection of commercial vehicles and drivers for roadside inspections.

TraCS Mobile and TraCS Office[5] are available without charge to any state seeking to increase its data collection effectiveness. TraCS is designed to be both modular and agency-customizable, allowing the flexibility to meet the majority of the data collection requirements without depending on a vendor to make these modifications. The software architecture takes into consideration that each agency (state and local) does business in a unique way and should not have to change its business practices to conform to a particular software application.

An option for larger LEAs that have many offices and LEOs is to implement a central server to collect the eCitations. An administrator workstation (WSP's approach) can run TraCS Office and manage the upload of an agency's eCitations to the state citation server. The architecture supports transmitting citations from a single workstation or a server, both using TraCS Office. The architecture is scalable to support small organizations as well as large multi-office LEAs.

*TraCS Mobile*

TraCS Mobile is a forms-based reporting application that LEOs use to collect electronic information that was previously written on paper forms. The TraCS Mobile software consists of a flexible, easy-to-use graphical interface. LEOs enter data into the system through a combination of text fields, pick lists, radio buttons, and check boxes, depending upon the requirement for each data element. The application also allows for defaults at each of the system, agency, and user levels, thus further aiding data entry.

TraCS allows officers to collect, validate, and print information in the vehicle using a laptop computer. LEOs can transfer information gathered with the Mobile client to TraCS Office and the database applications for analysis and retrieval. TraCS provides for data validation to ensure that data entered into forms is complete and accurate. Users receive immediate feedback regarding incorrect data and are prompted to correct any errors. State agencies can specify the validation requirements that meet their own needs for each type of form.

*TraCS Office*

TraCS Office is an agency-based workstation database application that contains a repository for collecting data from TraCS Mobile. TraCS Office uses relational database (i.e., SQL Server). Numerous reporting and analysis tools are available for agency-level decision making depending on agency specific needs.

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[5] The eCitation Pilot Test TraCS Configuration and Procedures Manual describes the technical architecture and specifications that WSP uses for the TraCS system. This document provides a configuration for TraCS Mobile, TraCS Office, and the WSP TraCS server. It also describes the WSP/AOC interface, WSP procedures, and support plans.

The desktop collects and displays all pertinent information transferred from the mobile application and provides menus and buttons to easily maneuver throughout the system. All the functions of the mobile application, including data entry, are also present in the TraCS Office application. The desktop offers a database and an export function to facilitate movement of TraCS-collected data to the agencies' legacy records systems.

TraCS includes these features and functionality:

- Small Footprint – Maximum Performance
- Forms Browser
- Modular Plug-and-Play Component-Based Architecture
- Data Bar
- Flexible Table-Driven Edits
- Enhanced Wireless Communications
- Windows 98, Windows 2000, Windows NT, and Windows XP Compatibility
- Local Records System Interface
- Software Development Kit
- AAMVA PDF417 Bar Code Reading
- Image Capturing
- Database Independence
- GIS Location Tool
- Security

TraCS is a set of components that can be deployed on a statewide basis for incident reporting. Components currently in Iowa's TraCS Pack include:

- Crash Reporting (The Iowa form is in substantial compliance with the Model Minimum Uniform Crash Criteria [MMUCC]; also available is a fully compliant "generic" MMUCC form.)
- Citation Issuance
- National Incident-Based Reporting System (NIBRS) Incident Reporting

- Motor Carrier Inspection Reporting
- Operating While Intoxicated Reporting

2. LEA Data Server

Many law enforcement agencies have their own systems in which they record the citations that their personnel issue. Agencies hold LEOs accountable for the citations they issue and track the citations forms and numbers.

The WSP, in its implementation of the pilot architecture, uses a server to collect the WSP citations. It plans to integrate this server with the citation tracking system and collect all WSP citations into a single repository. WSP is considering developing a number of other forms that troopers may use to replace manual paper forms (e.g., accident reports, time and activity reports, UDVIR). Troopers use TraCS Mobile to collect citation and other form data. Troopers download mobile data into TraCS Office, which runs on local detachment PCs. The data is then sent to the central WSP server. A WSP TraCS administrator will manage the environment using TraCS Office, which runs on the central server. WSP will develop an XML-based interface to the AOC statewide citation server.

LEAs will have the option of transferring data from their local TraCS Office system to AOC, or they may choose to establish a central server to collect agency data from multiple offices and send citations to AOC. This will depend on the agencies' need for collecting and processing information as part of their own local operations.

3. Transfer to AOC Statewide Server

LEAs will transfer the data the AOC server. They will use the eXtensible Markup Language (XML) standard for transferring data.[6] AOC, DOL, and WSP have established a standard record format for citations. By using the XML standard, many organizations can send citations using a variety of XML-compliant tools for formatting and transferring data.

4. Statewide Citation Server

The AOC will establish a statewide citation server that will collect citations from LEAs throughout the state. The statewide citation server will contain an SQL database that will retain the original citations that LEAs submit. LEAs will have the capability to create queries to pull information from this database.

[6] The TraCS transfer is not currently XML. The transfer to JIS is XML.

5. Judicial Information System

The AOC JIS provides case management automation to courts in Washington State. It includes systems for appellate, superior, limited jurisdiction, and juvenile courts. Its twofold purpose is: to automate and support the daily operations of the courts, and to maintain a statewide network connecting the courts and partner criminal justice agencies to the JIS database. The benefits of this approach are the reduction of the overall cost of automation and access to accurate statewide history information for criminal, domestic violence, and protection order histories.

The principal JIS clients are judicial officers, court managers, and other court staff. Other clients include users from the state's Department of Corrections, DOL, WSP, other law enforcement agencies, prosecutors, public defenders, the media, and law firms.

CLJ use JIS and DISCIS – the major limited jurisdiction application – and the Judicial Accounting Subsystem (JASS). More than 200 courts use these systems, which allow them to process cases from the initial filing to closure, incorporating such tasks as:

- Case Filing
- Calendaring
- Docketing
- Case Maintenance
- Finding/Judgment and Sentence Recording
- Accounts Receivable and Collections
- Receipting/Cashiering
- Trust Accounting
- Checking and Banking
- FTA and Warrant Processing
- Management and Statistical Reporting

AOC will insert citation data from the statewide citation server into the JIS data tables and elements that currently record citation information. AOC will then use new and existing applications to manage the data and to transfer data to other agencies such as DOL.

6. CLJ Update Citation Dispositions

CLJ will use the AOC DISCIS application to manage the adjudication of the citation. Court personnel will access the DISCIS application to obtain citation information. They will record the disposition information, as they do currently.

Currently, courts have to enter the original citation and then record the disposition of the citation. This new process will eliminate the original data entry of citations by the courts for citations that are received electronically.

7. Transfer of Citation Dispositions to DOL

A new electronic transfer process is being developed to transfer citation dispositions from AOC to DOL. DOL posts citation disposition information to the driver's record and takes other administrative actions required by state statutes.

The new electronic transfer of citation information is currently being developed by a joint DOL/ AOC taskforce. The intent is for AOC to provide all necessary and required data to support DOL's processing requirements

8. Drivers Database

The drivers database contains information about persons who have driver's licenses. Citation disposition information and Failure to Appear Notices are posted in the driver's record. LEOs query this database when they stop a person to identify and retrieve driving records. In addition, this database tracks financial responsibility information pertaining to accidents and is used by the insurance industry for rating drivers.

# IV. FINDINGS AND ISSUES

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This section provides the findings and issues that the pilot project team documented during the pilot. The first subsection captures the findings and key observations. The second subsection compares and contrasts the LEO work flows. The third subsection provides an analysis of the necessary conditions for implementing the application statewide.

## A. PILOT STUDY FINDINGS

This section presents a compilation of the observations and comments from the pilot participants. Troopers and CVEO conducted a pilot test from September through November 2002.

### 1. TraCS Software

- The TraCS application worked satisfactorily but is not user-friendly or flexible. The data bar is not in a convenient location for entering data into forms. Functionality and features commonly available in "Windows-based" programs are not available in TraCS.
- An automated process for distributing updates is needed. Developer tools are lacking functionality.
- Forms development is cumbersome, and the validation tool is difficult to use.
- An active question and answer forum is needed to get information and assistance from others using TraCS software.

### 2. eCitation Forms

- The citation forms worked well, and officers liked the drop-down lists, edits, and auto-complete feature in some fields.
- Some officers had difficulty scanning in signatures and bar codes.
- Some reported difficulty making corrections to data that was input into the form.
- Officers said they would like additional forms developed to accept the data captured with the electronic citations (examples: weight and speed affidavits, impound, DUI report, collision report, case report, commercial vehicle inspection, exchange of driver's information, etc.).

### 3. Hardware

- The laptops worked well, but some of the screens would not stay up while in the vehicles.
- Portable thermal printers were too slow in printing citations.
- Printer paper was a problem for some. Some preferred using the cut sheets rather than the paper rolls. Printer mounting was also an issue when troopers tried to use cut sheets.
- The Symbol Scanners were not always reliable and caused a conflict with MCN. The Welsh-Allen scanned better and was compatible with MCN.
- The wireless handheld monitor worked well, but the virtual keyboard was not conducive to fast data entry.
- Mounting platforms/pedestals in vehicles placed the computer too far away from the officer and were not ergonomically positioned for fast data entry.
- Mounting configurations need to be developed for each type of vehicle rather than trying to fit one setup into three different types of vehicles.
- Officers would have like additional software (MS Word) on laptops so they could be used for other work.

4. Technical Support

- Fixes and upgrades to forms should be made in a timely manner and be thoroughly tested before deployment.
- The process for supplying updates and upgrades to TraCS needs to be streamlined.
- Forms updates should be done using the Start Shift process in TraCS.
- Support staff who know how to fix the application, forms, and hardware issues need to be available.
- Requests for support need to be given a priority and responded to in a timely manner.
- A TraCS administrator needs to be available to support WSP processes. A complete setup of the same equipment used by the officers (laptop, scanner, printer) should be available to assist in testing and debugging forms and resolving software and hardware issues.

5. Training

- Training needs to be given in a structured classroom format using sample tickets, and officers should be given a good reference sheet.

- Officers need to be trained in the use of TraCS, computers, and Windows. Technical support personnel need to be trained in TraCS, forms development, and hardware.
- A WSP TraCS administrator should be trained to support WSP staff. WSP IT network staff should be trained in TraCS.

6. Work Flow Processes

- Officers felt they had to focus too much on their computers, shifting their attention from the violators for too long, creating a safety issue.
- Overall, the citation process took too much time due to not having a significant number of Washington driver's licenses with bar codes and not having the vehicle registration bar coded.
- Having to print four copies of each citation added significant time to the process.
- Having to capture two signatures also impeded the process.
- The data upload process needs to be made easier and more convenient so the officers are not limited to one location and do not have to remove their computers from their vehicles.

## B. COMPARISON OF LEO WORK FLOWS

The following table contrasts the work flow associated with issuing a paper ticket with the new proposed eCitation process. This assumes a single violation and a common violation.

| | Current | | Proposed | |
|---|---|---|---|---|
| **Activity** | **Duration (Minutes)** | **Cumulative (Minutes)** | **Duration (Minutes)** | **Cumulative (Minutes)** |
| **Before Vehicle Stop** | | | | |
| Stop vehicle with probable cause. | 3.0 | 3.0 | 3.0 | 3.0 |
| Call out with Vehicle License Number. | 1.0 | 4.0 | 1.0 | 4.0 |
| **During Vehicle Stop** | | | | |
| ***Pre-Ticket Work*** | | | | |
| Approach driver and explain the observed violation. | 2.0 | 6.0 | 2.0 | 6.0 |
| Request driver's license, proof of insurance, and vehicle title and registration. | 1.5 | 7.5 | 1.5 | 7.5 |
| Return to patrol car, and run a DOL driver's check. | 1.0 | 8.5 | 1.0 | 8.5 |

| Activity | Current | | Proposed | |
|---|---|---|---|---|
| | Duration (Minutes) | Cumulative (Minutes) | Duration (Minutes) | Cumulative (Minutes) |
| ***Create/Issue Citation*** | | | | |
| Record administrative information on citation. | 1.0 | 9.5 | NA | NA |
| Record driver information on citation. | 1.5 | 11.0 | NA | NA |
| Record vehicle information on citation. | 0.5 | 11.5 | 1.5 | 10.0 |
| Record other observed violations on citation. | 0.5 | 12.0 | 0.5 | 10.5 |
| Sign and fill in (stamp) court information on citation. | 0.5 | 12.5 | 0.5 | 11.0 |
| ***Finish Citation*** | | | | |
| Obtain driver's signature, and advise driver of obligation. | 2.0 | 14.5 | 2.0 | 13.0 |
| **After Vehicle Stop** | | | | |
| Complete case report. | 3.0 | 17.5 | 3.0 | 16.0 |

The difference in the two scenarios is that the LEO is able to retrieve information by scanning the bar code on the digital driver's license and on the vehicle title and registration form, saving about 2 minutes in the overall process. The basic stop, driver approach, and citation issuance process is largely the same.

The more forms that LEOs can use in TraCS, the more savings will be realized in terms of LEO work time. EXHIBIT II shows a chart that illustrates the impact of using additional forms. Each form contains three data blocks that are common among nearly all forms used in an incident, including:[7] drivers, vehicles, and date/time/location information. Each form has unique information that the LEO needs to supply, which takes an average of 1½ minutes to complete per form. The driver's license and vehicle registration can be captured once from bar codes and LEOs can enter the date, time, and location once. This common information can be automatically loaded into subsequent forms. The LEO need only key the unique data associated with the form. The savings associated with each subsequent form accumulates, resulting in dramatic time savings. Approximately 4 minutes per additional form is saved.

The other difference is that at the end of a shift the LEO requires about 15 minutes to organize the paperwork and get the ticket information into the citation receptacle to be delivered to the CLJ. In the new eCitation scenario, the LEO will need about 5 minutes to dial in and upload the citation information.

[7] On average it takes a LEO 1.5 minutes each to fill out the drivers and vehicle data blocks. It takes about 1 minute to fill in the date, time, and location data blocks.

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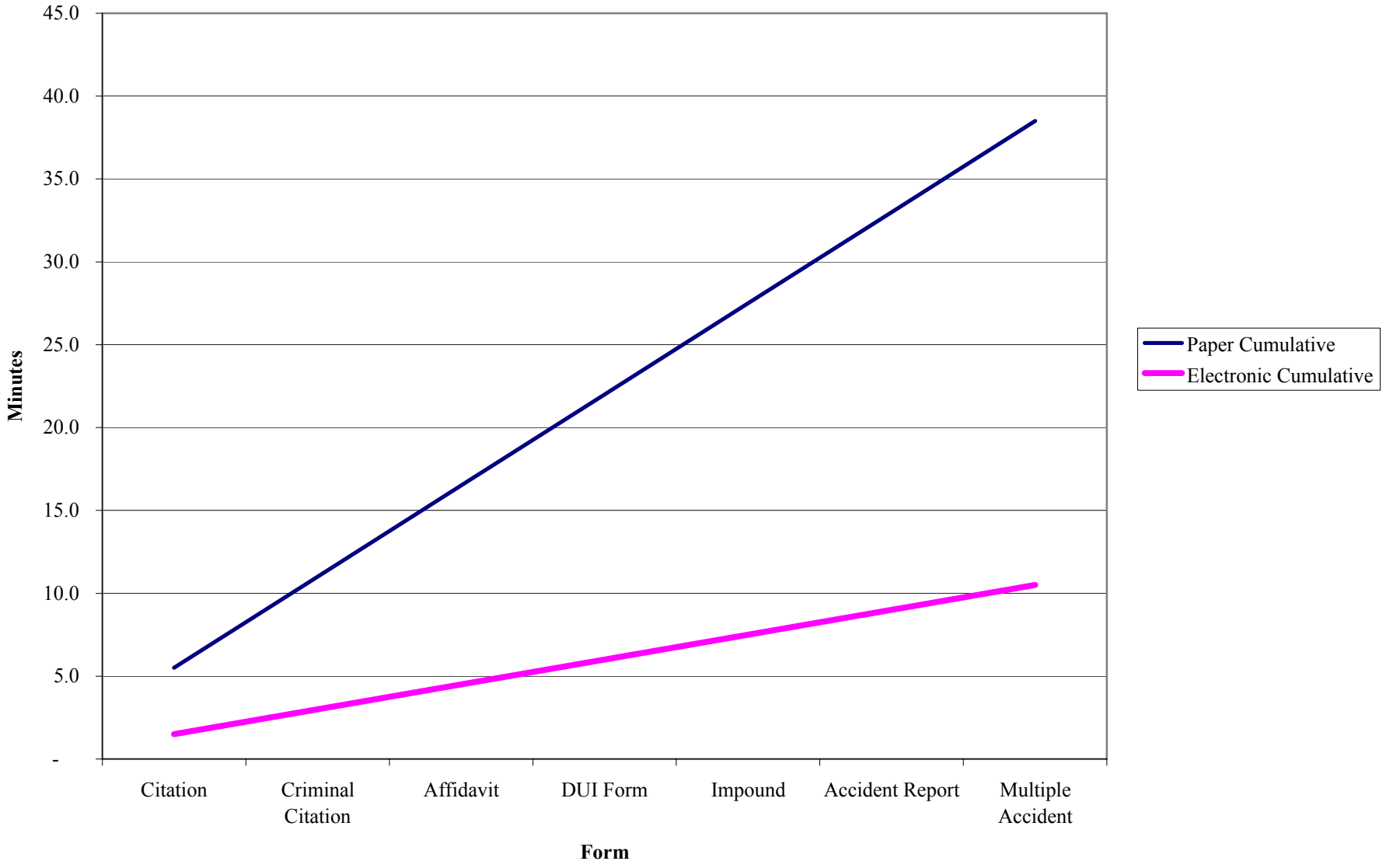
## IMPACT OF eCITATION ON LEO



## C. ANALYSIS OF ISSUES AND FINDINGS

To adequately implement a statewide eCitation application, certain necessary conditions must be put into place before the program is viable. Most issues are manageable; however, some necessary conditions are connected to larger programs that have their own time frames. This section discusses these necessary conditions. EXHIBIT III shows a decomposition of the necessary conditions.

The four necessary conditions include:

- LEOs Must Accept the Application
- Funding for Equipment
- State eCitation Program in Place
- Changes to the TraCS Technology

### 1. LEOs Must Accept the Application

LEOs need to accept the application, and the system should be a benefit for them and not detract from their operations. Since LEOs are the source of the citation, they must accept and embrace this new process. LEAs will not implement new processes that impact their LEO operations. Following is an outline of the necessary conditions believed to critical for law enforcement acceptance of the eCitation process:

- *Officer Safety Issues Must Be Addressed* – Pilot troopers are concerned that keying data into the computer required their attention, and they lost the focus on the motorist occasionally. This issue is really a part of the LEO work flow acceptance issue and should be resolved as an acceptable work flow process that supports officer safety factors.
- *The LEO Work Flow Must Be Acceptable* – The key issue to the LEOs is to have a smooth work flow that gives them the opportunity to do their jobs as quickly as possible with as little rework as possible. The issues that contribute to this includes:
  - » *Useable DOL Bar Codes* – It takes too long to key the citation information into TraCS Mobile forms. However, troopers participating in the pilot see a real advantage to being able to acquire the driver's information from the digital driver's license that is available in bar code format. In addition, they have noted the need for a bar code affixed to the vehicle registration that would contain vehicle information. With these two bar codes, the entry of required data would be reduced to a few fields per-

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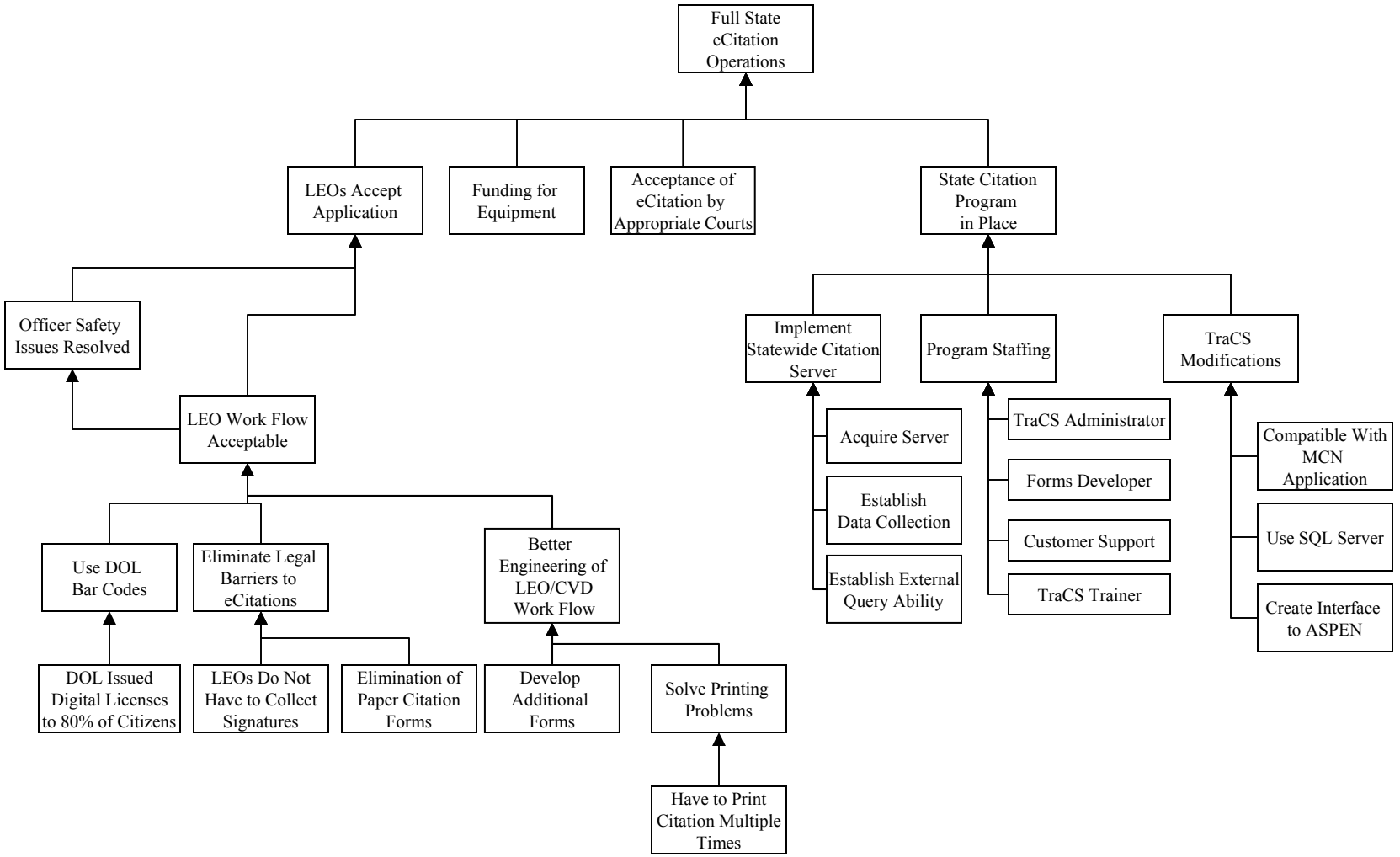
## NECESSARY CONDITIONS



taining to the violations and incident circumstances. This has the potential of having the greatest impact on the overall work flow that affects LEOs positively.

DOL is currently in a 5-year program to migrate the state's drivers to use the new digital driver's license. Approximately 20 percent of the state's drivers are required to renew their driver's licenses every fifth year. DOL estimates that they will reach 80 percent conversion by 2005. Troopers feel that this is the minimum that is needed to make the business flow worth using the eCitation data collection techniques. Only 20 percent of the drivers that they contact would require either paper citations or the LEO entering all the information into the eCitation forms.

» *Eliminate Legal Barriers to eCitations* – Two statutes currently prevent eCitations use. The first is that the statutes refer to the requirements of collecting and exchanging physical citation forms. The statutes need to be changed to accommodate the exchange of electronic citation data, not just paper citations.

The second statutory problem is the requirement of needing original signatures on the citation. The current statutes require printing multiple citations and requesting two signatures from the motorist: one for the copy that is kept by the officer; and one that the motorist retains. The statutes need to be changed to require at most only one signature, and preferably no signature at all. Several other states have passed such statutes that enable issuing electronic citations.

» *Improved the LEOs Work Flow* – Several work flow issues must be reengineered to streamline business practices so that the eCitation approach reduces the overall work or at least does not cause more.

- *Develop and Integrate Other Forms Into the LEO Work Flow* – Troopers participating in the eCitation pilot suggest that TraCS be used to capture other data that they routinely gather. Since much of the data gathered currently on different paper forms is essentially the same, the system potentially could reduce redundant data entry. Examples of other forms include: weight and speed affidavits, impound, DUI report, collision report, commercial vehicle inspection, exchange of drivers information, etc. The more forms that are used, the more savings will occur in process time for LEOs.

- *Solve Printing Problems* – The printing of citations involves a number of issues that need resolution to be effective. Currently, the pilot requires printing three copies of the citation, which can take 45 seconds each. The type of paper (rolls versus cut sheets) needs to be resolved. Mounting and placement of the printer in the vehicle is also problematic.

- *Data Upload Process Needs to be Refined* – Troopers report that the current process to upload the TraCS Mobile data into the TraCS Office system is

cumbersome. WSP needs a better methodology for uploading the data. Several areas to explore include use of an Internet Web page to facilitate data transfer. Use of wireless technology is another idea that should be explored for improving transferring data from the LEO to the state citation server.

2. Funding for Equipment

Acquisition of the equipment (laptops, printers, office PCs, etc.) is a critical factor in deploying the eCitation. Following are the costs that WSP experienced in implementing its TraCS architecture:

| Item | Quantity | Unit Cost | Extended Cost | Notes |
|---|---|---|---|---|
| Laptop, Software, and Printer (Runs TraCS Mobile) | 4 | $8,000 | $32,000 | Includes vehicle mounting and installation. |
| TraCS Office Server[8] | 1 | $10,000 | 10,000 | Central server located in Tumwater. |
| TraCS Administrator Workstation | 1 | $4,000 | 4,000 | Standard workstation. |
| TOTAL | | | $46,000 | |

Several configurations are likely to occur. The table below demonstrates different configurations based upon a small, medium, and large law enforcement organization and the associated costs:

| Description | Mobile Units[9] ($8,000 Each) | Servers ($10,000 Each) | Administrator Console ($4,000 Each) | Total Cost |
|---|---|---|---|---|
| Small 6-Unit Police Department Single Office | 6 | 0 | 1 | $52,000 |
| Moderate 20-Unit Organization 3 Offices | 20 | 0 | 3 | $172,000 |
| WSP – Central Administration | 560 | 1 | 1 | $4,494,000 |
| System Administrator[10] | | | | 60,000 |
| | | | | $4,554,000 |

[8] The WSP TraCS server was configured to support a statewide rollout of eCitations.

[9] The laptop computers used in the pilot are top-of-the-line, high-end, ruggedized units. Potential savings may be realized in using less costly laptops.

[10] TraCS System Administrator is the minimum support requirements. Additional FTE support costs may be necessary. Iowa has 4.5 FTEs supporting their TraCS program which consists of 275 officers.

Law enforcement agencies will require funding assistance to secure the necessary funds to acquire and implement this program within their organizations.

3. State Citation Program in Place

A statewide program administrative group will need to be formed to support the eCitation program, train local agencies, and manage the eCitation data. The following program components will be required:

- *Implement the Statewide Citation Server* – AOC will need to implement a central collection server and configure it with the necessary software and procedures to gather data and upload the data into the JIS system. Since this will be the location of the original citation, AOC will need to provide a mechanism for law enforcement agencies to access the citations that they contribute.
- *State eCitation Program Staffing* – The pilot identifies the need for a central program staff to manage the program, support the technology, and provide training. The proposed staffing includes:
  - » Program manager.
  - » TraCS administrator.
  - » Network administrator.
  - » TraCS application forms developer.
  - » Customer service representatives/trainer.
  - » Help desk.

  This program staff will support the statewide rollout and use of the eCitation. It will require scaling based upon the number of law enforcement agencies that participate in the eCitation program.

4. Changes to the TraCS technology

TEG maintains the TraCS under direction of the Iowa Department of Transportation. A multistate steering committee identifies and prioritizes the changes to the TraCS software product. TEG is currently making several significant changes that will benefit Washington's eCitation program, including:

- Incorporate new forms to TraCS Mobile.

- Create an ASPEN/VSIS data sharing interface.
- Create additional interfaces (SAFER, PIQ, CDLIS, ISS).
- Migrate to an MS SQL database that operates within TraCS Office.
- Improve the SDK Workbook (including process flow builder, transmission/data import/ export builder, validation builder, database builder).

Washington has identified several issues that need to be placed into the pipeline of fixes. Washington needs to become active with the TraCS consortium of states and work to improve the shortcomings of the TraCS software.

Enough states are adopting TraCS to assure that it will evolve into a useful software package for collecting field data, including citations. An impressive list of enhancements are being made to TraCS to make it a viable product to use. With the integration to ASPEN and other UDVIR systems, its value will increase. Potential funding is likely from federal sources that are trying to integrate the traffic and UDVIR programs.

# V. NEXT STEPS

# V. NEXT STEPS

This section identifies the critical success factors and action items that have been identified to move toward a statewide implementation.

## A. CRITICAL SUCCESS FACTORS

The eCitation Steering Committee has developed the following critical success factors before this program can be rolled out statewide. These critical success factors are organized within the following topics:

- Business Processes
- Technology
- Acceptance
- Policy
- Funding

### 1. Business Processes

- Current business functions performed by officers, court staff, and DOL staff continue to be accomplished with no degradation in performance. These should include:
  - » Case filing time in court is decreased.
  - » Prefiling payments can still be accommodated.
  - » Arraignment hearings can still be scheduled.
  - » Citation clarity is improved.
  - » Citation accountability is maintained.
  - » Case adjudication information is transferred to DOL.
- The process for correcting electronic citations filed with the court must not be overly burdensome.
- Trooper safety is not impaired:
  - » Emergency egress capability to right side of vehicle.
  - » No more than two trips to violator's vehicle for officer.

» Hardware must be reliable and comfortable to use in vehicles.

- Courts, DOL, and law enforcement realize time savings and more accurate processing of citations.

  » Mistakes are reduced.

  » Return of citations to officers is reduced.

2. Technology

- The application should be easy to use and therefore somewhat self-directing. Minimal training should be required.
- User-friendly install/hookup and removal of computer in/out of vehicle.
- Additional forms can be created to share data and reduce redundant data entry.
- AOC sending all electronic citations to DOL electronically, using the DHIP format and processes.
- Modification of TraCS to use SQL server databases for a more efficient distribution of a large amount of data among a greater number of agencies and the courts.
- Upgrades to WSP network infrastructure are made to be able to handle the additional data transfer from multiple offices.
- Compatibility with Commercial Vehicle Division (CVD) computer programs (ASPEN, TripMaker, etc.).
- Compliance with JIN XML-based data exchange standards.
- Equivalent laptop and PDA versions of TraCS.
- Identification of required and allowable hardware and software specifications.

3. Acceptance

- Motoring public should not register a negative response to the eCitation process or ticket format. Officers/troopers will take general note of public response.
- eCitations are readily accepted in the courts and withstand legal challenges. There is already an acceptance of electronic citations by a majority of the largest municipal and county courts and law enforcement agencies.

- All officers are using e-citations (or at least a high percentage in the urban areas of Washington) should result in decrease in the number of citations manually keyed by DOL.
- Officers report a sense that this process enhances their safety.

4. Policy

- RCW Law/Washington Administrative rule changes are enacted to allow electronic citations without paper and to eliminate issues capturing violator's signature.

5. Funding

- Adequate funding for hardware, training, and ongoing support resources to enable a phase-in of additional officers statewide. Not only for WSP, but local law enforcement agencies as well.
- Positive business case for all stakeholders (it has to increase efficiency/save money/save resources for all participants in the required work flow).

## B. ACTION ITEMS

The central recommendation of this study is that the business case warrants continued development of the eCitation business program. Several issues have been raised above that need attention. Some issues require the state to wait before moving toward a statewide implementation.[11] However, a number of action items need research, planning, and resolution. The following table summarizes these action items. Many of these action items are projects consisting of planning, research, development, and design.

| No. | Action Items | AOC | WSP | WASPC | DOL | Notes |
|---|---|---|---|---|---|---|
| 1. | DOL completes transition to the new digital driver's license to 80 percent level. | | | | XX[12] | DOL estimates 80 percent will occur in July 2005. |
| 2. | DOL places bar code on vehicle title and registration. | | X | | XX | |
| 3. | Legislation to allow electronic citation. | XX | X | X | X | |
| 4. | Legislation to eliminate signature requirement. | XX | X | X | X | |

[11] The pilot team has developed a statewide rollout plan.

[12] XX means lead agency; X means participating agency

| No. | Action Items | AOC | WSP | WASPC | DOL | Notes |
|---|---|---|---|---|---|---|
| 5. | Identify and develop additional forms for LEOs. | | XX | X | | |
| 6. | Identify and resolve printing problems. | | XX | | | |
| 7. | Identify and resolve installation of TraCS Mobile equipment in LEO vehicles. | | XX | X | | |
| 8. | Develop model funding package. | XX | X | X | X | Develop business case for securing funding. |
| 9. | Develop a communications plan for discussing eCitation with state's LEAs and CLJs. | XX | X | X | X | |
| 10. | Acquire and implement statewide citation server. | XX | | | | |
| 11. | Fund and establish statewide eCitation program staff. | XX | XX | X | | |
| 12. | Complete eCitation interface between AOC and DOL. | XX | | | XX | |
| 13. | Develop and prioritize the list of TraCS enhancements and submit to TraCS steering committee. | X | XX | X | | |
| 14. | Develop curriculum for TraCS training. | X | XX | X | | |
| 15. | Complete the implementation of the XML data transfer from WSP, AOC, and DOL. | XX | X | | X | |
| 16. | Establish a technical standard for using TraCS and integrating with the statewide citation server. | X | XX | X | | |
| 17. | Study integration of Washington TraCS with ASPEN and other Commercial Vehicle Enforcement systems. | | XX | | | |